

PATENT COOPERATION TREATY



PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

Applicant's or agent's file reference	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/EP2004/050354	International filing date (day/month/year) 24.03.2004	Priority date (day/month/year) 01.04.2003	
International Patent Classification (IPC) or national classification and IPC G01S15/10, G01S15/52, G01S15/58, G01S15/89			
Applicant THALES et al.			

1.	This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2.	This REPORT consists of a total of 7 sheets, including this cover sheet.
3.	This report is also accompanied by ANNEXES, comprising: <div style="margin-left: 20px;"> <p>a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of 3 sheets, as follows:</p> <div style="margin-left: 20px;"> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of Administrative Instructions).</p> <p><input checked="" type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> </div> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)), containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> </div>
4.	This report contains indications relating to the following items: <div style="margin-left: 20px;"> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement according to Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p> </div>

Date of submission of the demand 01.02.2005	Date of completion of this report 13.06.2005
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Box No. I. Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b)).
 - ☐ publication of the international application (under Rule 12.4).
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3).
2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, pages

1-5 as originally filed

Claims, No.

1-13 received on 11.02.2005 with the letter of 01.02.2005

Claims, pages

6-8 received on 11.02.2005 with the letter of 01.02.2005

Drawings, sheets

1/2-2/2 as originally filed

Drawings, figures

1-2 as originally filed

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

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International application No.
PCT/EP2004/050354

4. ☒ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)):

- ☐ the description, pages
- ☒ the claims, Nos. 10
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of those sheets may be marked "superseded."

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty	Yes:	Claims	3-5,7-9
	No:	Claims	1,2,6,10-13
Inventive Step	Yes:	Claims	
	No:	Claims	1-13
Industrial Applicability	Yes:	Claims	1-13
	No:	Claims	

2. Citations and explanations

see separate sheet

Concerning points I. and V.

1 Documents

Reference is made to the following documents in the present notification:

- D1: US-A-4 562 438 (WILKINSON CHRISTOPHER F ET AL) 31 December 1985 (1985-12-31)
- D2: US-A-5 212 490 (NELSON DAVID E ET AL) 18 May 1993 (1993-05-18)
- D3: EP-A-0 898 176 (STN ATLAS ELEKTRONIK GMBH) 24 February 1999 (1999-02-24)
- D4: CARMILLET V ET AL: "Low-speed targets sonar detection using autoregressive models in reverberation; experimental performances for wideband signals" 28 September 1998 (1998-09-28), OCEANS '98 CONFERENCE PROCEEDINGS NICE, FRANCE 28 SEPT.-1 OCT. 1998, NEW YORK, NY, USA, IEEE, US, PAGE(S) 1285-1289, XP010311934 ISBN: 0-7803-5045-6
- D5: US-A-2 431 854 (WOOD LEON G S) 2 December 1947 (1947-12-02)
- D6: FR-A-2 769 372 (THOMSON MARCONI SONAR SAS) 9 April 1999 (1999-04-09)

2 Concerning the provisions of Rule 70.2c) PCT

This report is drawn up as if the modification of **Claim 10** had not been made, since this modification, namely the passage "uses jointly", seems to go beyond the specification of the invention appearing in the international application as filed (R. 70.2c) PCT). In particular, these words appear nowhere in the description as filed.

3 Concerning the provisions of Article 33(2) PCT

The subject matter of **Claims 1, 2, 6, 10-13** does not comply with the novelty criterion defined by Article 33(2) PCT.

3.1 Document D1 discloses the subject matter of Independent Claim 1 (the absence of clarity apart, cf. paragraph 5.1):

- Method of processing signals received **corresponding to a signal emitted comprising by recurrence two pulses** (col. 1, l. 6-10), a **Doppler tolerant broadband pulse** (col. 1, l. 59: "frequency modulation (e.g., frequency sweeping)"[*]) and a **Doppler intolerant broadband pulse** (col. 1, l. 59: "frequency modulation; col. 1, l. 60-61: "phase modulation"; col. 1, l. 61: "linear or non-linear" [*]), comprising:

- a step of **detecting objects performed on the part of the signal received corresponding to the pulses** (cf. paragraph 5.1: to the Doppler intolerant pulses) and providing an alarm for each object detected (col. 2, l. 7-11), and
- a step of classifying the objects detected (this is executed by all radar or sonar systems)
- **the classification of the objects detected is performed on the part of the signal received corresponding to the Doppler intolerant pulses for the alarms satisfying at least one predetermined criterion** (col. 2, l. 11-16; col. 4, l. 39-44).

[*] it is well known that nonlinear modulations of frequency are Doppler insensitive, unlike binary modulations of frequency or of phase, which are Doppler sensitive (cf. for example D2: col. 1, l. 64-65; col. 4, l. 19-27; D3: col. 1, l. 46-55; col. 2, l. 39-42).

3.2 Document D4 discloses the subject matter of **Independent Claim 10** (in the initial version, cf. paragraph 2; the absence of clarity apart, cf. paragraph 5.2):

- Method of processing signals (abstract) characterized in that
- a first pulse is of **HFM** type (col. 6, l. 10-22) and/or
- a second pulse is of **BPSK** type (col. 6, l. 23-30).

3.3 **Independent Claim 11** defines the device corresponding to the method according to **Claim 1** with the additional characteristic of an "active sonar". Now, this characteristic is also described in document D1 (col. 6, l. 23).

3.4 Document D1 also discloses the additional characteristic of **Dependent Claim 2**:

- the predetermined criterion applied to the alarms comprises a **comparison of the alarms with a predetermined threshold** (col. 2, l. 11-16; col. 4, l. 40-44).

3.5 Furthermore, document D1 discloses the additional characteristic of **Dependent Claim 6**:

- a **step of estimating Doppler** (col. 5, l. 52: col. 6, l. 11) of the alarms corresponding to the Doppler intolerant pulses for the alarms **satisfying at least one predetermined criterion** (col. 2, l. 11-16; col. 4, l. 40-44), and/or the associated standard deviations.

- 3.6. Document D1 further discloses the additional characteristic of **Dependent Claim 12**:
- the means of emission emit the two pulses **at different instants with totally or partly overlapping frequency bands** (col. 1, l. 65-66; col. 6, l. 25-27).

- 3.7 Furthermore, document D1 discloses the additional characteristic of **Dependent Claim 13**:
- the means of emission emit the two pulses **simultaneously with distinct frequency bands** (col. 1, l. 67-68; col. 6, l. 23-25).

4 Concerning the provisions of Article 33(3) PCT

The subject matter of **Claims 3-5 and 7-9** does not involve any inventive step as defined by Article 33(3) PCT.

- 4.1 The additional characteristics of **Dependent Claims 3-5, 7 and 9** pertain to a standard technical approach for the person skilled in the art. They relate to **signal processing measures that are well known**.
- 4.2 The additional characteristic of **Claim 8**, namely **the estimation of the inherent Doppler**, is well known in radar or sonar systems (cf. for example D5, col. 2, l. 28-39; D6, abstract).

5 Concerning the provisions of Article 6 PCT

The present patent application does not fulfil the conditions stated in Article 6 PCT, **Claims 1, 10 and 13** not being clear.

- 5.1 **Independent Claim 1** is not clear since the antecedent of "first pulses" (l. 9) is missing.
- 5.2 **Independent Claim 10** is not clear since the antecedents of "the first pulse" and of "the second pulse" (l. 12-13 of the initial version, cf. paragraph 2) are missing.
- 5.3 Concerning **Claim 13**, the reference to "any one of the preceding claims" is not correct: the subject matter of **Claim 13** is a device ("active sonar"). This claim can therefore relate only to a claim of the same category, that is to say to **Claims 11 or 12**.

6 Observation

The subject matter of the present patent application as defined in the description (p. 4, l. 19-21), namely "the matched filtering processing on the BPSK channel signals **is performed only** on the alarms arising from the processing of the HFM pulses", would appear to involve an inventive step (Article 33(3) PCT). However, the independent claims are not sufficiently specific.